COST IC0604 – WG2 Standards
IHE/HL7 Anatomic Pathology

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August 27, 2011
Helsinki

Meeting material:
Agenda

- Change proposals (3:00 – 3:30)
  - Electronic request (M.Garcia)
    - Castilla de la Mancha experience (ISOFT) & discussion about the structured content
  - New APSR templates (for biobanks, M.Kennedy – NCI)
- Integration profile: Reporting workflow (G.Rodriguez – SATEC) (3:30 – 3:45)
- White paper: enhanced imaging workflow (T.Schrader) (3:45 – 4:00)
- PathLex (4:00 – 5:00)
- Next steps (5:00-5:30)
  - Road map – Next meetings – Co-chair election
  - Deployment & Governance
IHE Anatomic Pathology TF

- Current Technical Framework - Revision 2.0
  July 23, 2010
  - Vol. 1 (PAT TF-1): Integration Profiles
  - Vol. 2 (PAT TF-2): Transactions
- Anatomic Pathology Workflow (APW)
- Supplements for Trial Implementation
  - Will be tested at subsequent IHE Connectathons
- Anatomic Pathology Reporting to Public Health (ARPH) - Published 2010-07-23
- Anatomic Pathology Structured Reports (APSR)
  - Published 2011-03-31
  - APSR Value Sets Appendix - Published 2011-03-31
Change proposal
Electronic request
PAT-1 Placer Order Management (HL7)

M.Garcia
Change proposal
New APSR templates
Background (templates 2010-11
From clinical document models…

- Recent recommendations for required, preferred, and optional elements for any APR of surgical pathology, regardless of report types [Goldsmith 08]
- National initiatives
  - Anatomic Pathology SR (Netherlands, Germany, Australasia)
  - Cancer APSR
    - US - CAP (College of American Pathologists)
      - 67 cancer checklists and protocols (October 2009)
    - France - SFP (French society of pathology) – INCa (French National Cancer Institute)
      - Minimum data sets for cancer APSR in 20 locations (85% of new cancers in France) (required by accrediting bodies)
  - Australasia
    - 6 templates for cancer APSR
  - UK Royal college

New APSR templates

- **Thematic needs**
  - Patient care coordination
    - Surgical pathology
      - New organ-specific templates (n=20 -> 80)
      - All specimen types (biopsies, cytology, etc)
    - Autopsy
  - Public health (e.g. screening)
  - Research (e.g. bio-banking)
    - AP observations for biomarkers

- **National needs**
  - France: 7 new locations

- **International governance?**
  - Building and maintaining templates & their semantic is far from being only an “implementer’s issue”
  - Harmonization?
    - US CAP Cancer checklist/ RCPA (Australasia)/UK RCP
Governance, methodology & tooling for templates management

New project
Users’ needs
Detailed clinical models

Templates (CDA, ) & terminologies creation & management

Public comments

Trial implementation

Connectathon - Demo

Users (scientific associations, governmental agencies, coordinator)

Users (scientific associations, governmental agencies, coordinator)
Template & terminology editors/administrators

Users & vendors

Template & terminology administrators
Users & vendors

Collaborative environment
IHE WIKI
On-line consensus (Delphi)

Collaborative editing tools (CollaborativeProtégé, ITM)
Template registry/repository
Terminology services (STS)

Collaborative environment
IHE WIKI

Template registry/repository
Terminology services (STS)
HL7 Data types

- **Booléen**
  - value: Boolean [0..1]
- **String**
  - value: String [0..1]
- **Concept Descriptor**
  - code: String [0..1]
  - codeSystem: String [0..1]
  - codeSystemName: String [0..1]
  - codeSystemVersion: String [0..1]
  - display: String [0..1]
  - originalText: String [0..1]

**Physical Quantity**
- **Real**
  - value: Real [0..1]
- **Integer**
  - value: Integer [0..1]
CTS2 model

HL7
STS (Standard Terminology Server)

About 20 « read only » services are available

Testables via STS web site
STS (Standard Terminology Server)

CTS2

SKOS

OWL
Integration profile

Anatomic Pathology Reporting Workflow (ARW)

G. Rodriguez – SATEC
New profile: Anatomic Pathology Reporting Workflow (APRWF)

- **Issue**
  - In the current Anatomic Pathology Workflow (APW) reports are treated as part of the order result tracking exchange information.
  - But there is no report oriented activity description, and thus it might be challenging for implementers to find scalable, easy to build architectures offering the capabilities to manage, store and retrieve report information.
  - The Order Filler is too tightly coupled with the reporting tasks so it also difficult for implementers to provide a scalable solution.
  - This proposal aims to solve the presented problems by providing a Reporting Workflow profile inspired by the similar one described in the Radiology Technical workflow.

- **Expected benefits**
  - The Reporting workflow will improve management of reporting tasks introducing reporting worklists and observation results queries as a method to perform order result consultation.
  - All this allows external systems to retrieve the report in a raw format allowing then to further process that information.
    - This will allow, for example, showing the report along with links to the DICOM images which could be opened with the chosen viewer.

- **Proposal Editors**
  - Gustavo Rodríguez (gustavo.rodriguez@satec.es) - Antonio González (antonio.gonzalez@satec.es) - Date: 2009/12/17
  - Mtuitive?
Anatomic Pathology Workflow (APW)

Actors & transactions

Order Placer
- Placer Order Management [PAT-1]
- Filler Order Management [PAT-2]

Order Filler
- Procedure Scheduled and Updated [PAT-4]
- Query Modality Worklist [PAT-5]
- Modality Procedure Status Notification [PAT-6]
- Order Results Management [PAT-3]

Image Manager
- Storage Commitment [RAD-10]
- Query Images [RAD-14]
- Modality Image Stored [RAD-8]

Image Archive
- Storage Commitment [RAD-10]

Acquisition Modality

Evidence Creator
- Evidence Document Stored [RAD-43]
- Evidence Images [RAD-16]

Image Display

Order Result Tracker
Anatomic Pathology Reporting Workflow (APRWF) – Actors & transactions

→ Procedure Scheduled Or Updated [PAT-4]
← Order Results Management [PAT-9]

↑ Order Results Creation or Update [PAT-8]
↓ Query Reports [PAT-7]

↓ Order Results Management [PAT-3]

Order Filler

Order Result Tracker

Report Manager

Report Creator

Report Reader
PathLex
PathLex, a single lexicon in the Anatomic Pathology domain

- Launched by IHE Anatomic Pathology
  - Collaboration of College of American Pathologists (CAP), ADICAP, French Society of Pathologists (SFP), SEAP (Spanish Society of Pathology).
  - Registered as external terminology used by HL7
- Purpose and scope (very similar to those of the RadLex project)
  - “designed to satisfy the needs of Anatomic Pathology information system vendors and users by adopting the best features of existing terminology systems
    - using if possible available concepts defined in reference biomedical terminologies or ontologies like SNOMED-CT or CIM-O (rather than “re-inventing the wheel”)
    - while producing new terms to fill critical gaps.
PathLex, a single lexicon in the Anatomic Pathology domain

- The need is to guaranty that standard messages and document structures are semantically consistent within and across standards (HL7 v2.5, HL7 v3, DICOM).
- PathLex unifies and supplements vocabulary tables defined by DICOM, HL7 and IHE
- Current status & scope: IHE APSR supplement
PathLex, an “interface terminology” mapped to “reference terminology”

- “Model of use” - PathLex
  - HL7/DICOM/IHE vocabulary tables contain relatively common clinical terms designed to improve acceptability of information systems to healthcare providers.

- Reference terminology (e.g. SNOMED CT)
  - Emerging global health terminology standard published by IHTSDO
  - Provides unified meanings for clinical terms
    - from different languages by assigning them to language-independent concepts.
    - typically optimized to support the storage, retrieval, and classification of clinical data.

- HYPOTHESIS: Mapping interface terminologies (as part of a model of use) to standard reference terminologies (as part of the model of meaning) is a reasonable strategy towards semantic interoperability
PathLex
Current status

- Designed to support data capture of anatomic pathology findings accordingly to the IHE content profile “Anatomic Pathology Structured Report” (APSR).

- Terms or expressions (n= 1781) corresponding to :
  - Organ-specific elements (n=488)
    - Procedures (n=21)
    - Anatomic pathology observations (n=467)
      - post-operative staging of infiltrating cancer using the TNM staging system (n=63).
  - Value sets : all possible values coded elements (procedure target sites and qualitative observations (e.g Histologic type of Infiltrating malignant neoplasm of the breast))
    - US extension (n=924) – pTNM values (n=369/924)
Specimen Collection Procedure templates

- A specimen collection procedure within an organ-specific APSR Document Content Module represents
  - the characteristics of the specimen (identifiers and type)
  - the procedure that collected it
    - Type of procedure, time interval, performer (person and organization), approach site, target site.
Specializing element Content Modules

- **Header**
  - **Author** 1.3.6.1.4.1.19376.1.8.1.4.2
  - **Content Validator** 1.3.6.1.4.1.19376.1.8.1.4.3
  - **Informant** 1.3.6.1.4.1.19376.1.8.1.4.6
  - **Additional participant in an entry** 1.3.6.1.4.1.19376.1.8.1.4.7
  - **Specimen Collector in Header** 1.3.6.1.4.1.19376.1.8.1.4.1

- **Body**
  - **Specimen description**
    - **Specimen Information Organizer** 1.3.6.1.4.1.19376.1.8.1.4.4
    - **Specimen Collection Procedure generic template** 1.3.6.1.4.1.19376.1.3.1.2
  - **Problem Organizer** 1.3.6.1.4.1.19376.1.8.1.4.8
  - **AP Observation generic template** 1.3.6.1.4.1.19376.1.8.1.4.9
  - **Embedded Image** 1.3.6.1.4.1.19376.1.8.1.4.10
Specimen Collection Procedure templates

Various specimen collection procedures that can be performed on this specific organ.

Various precise locations for collecting specimens from this specific organ.

- procedure code
- effective time of collection
- approach site code
- target site code
- specimen collector (performer)
- Product collected (the specimen with its id and type)
- Time of specimen reception in lab

genericspecimen collection procedure template (templateld[@root="1.3.6.1.4.1.19376.1.3.1.2"])

organ-specific specimen collection procedure template (templateld) determines value sets

constraining the vocabularies for the contextual organ
### List of Specimen Collection Procedure templates

<table>
<thead>
<tr>
<th>Document template id</th>
<th>Document template name</th>
<th>Element template id</th>
<th>Element name</th>
<th>Element fully specified name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Specimen collection procedure</td>
<td>Breast-Specimen Collection Procedure</td>
</tr>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.8</td>
<td>Cervix APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.8</td>
<td>Specimen collection procedure</td>
<td>Cervix-Specimen Collection Procedure</td>
</tr>
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<td>Colon APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.2</td>
<td>Specimen collection procedure</td>
<td>Colon-Specimen Collection Procedure</td>
</tr>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.9</td>
<td>Endometrium APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.9</td>
<td>Specimen collection procedure</td>
<td>Endometrium-Specimen Collection Procedure</td>
</tr>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.11</td>
<td>Esophagus APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.11</td>
<td>Specimen collection procedure</td>
<td>Esophagus-Specimen Collection Procedure</td>
</tr>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.1.1</td>
<td>Generic APSR</td>
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<td>Specimen collection procedure</td>
<td>Generic-Specimen Collection Procedure</td>
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<td>1.3.6.1.4.1.19376.1.8.1.1.2.7</td>
<td>Kidney APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.7</td>
<td>Specimen collection procedure</td>
<td>Kidney-Specimen Collection Procedure</td>
</tr>
</tbody>
</table>
## Value set OIDs for each Specimen Collection Procedure templates

<table>
<thead>
<tr>
<th>Element name</th>
<th>Element fully specified name</th>
<th>Element type</th>
<th>Concept domain</th>
<th>Value set or code</th>
<th>Rim source</th>
<th>Value set (for CD element)</th>
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</thead>
<tbody>
<tr>
<td>Specimen collection procedure</td>
<td>Breast-Specimen Collection Procedure</td>
<td>procedure.code</td>
<td>CD</td>
<td>specimen collection procedure</td>
<td>1.3.6.1.4.1.19376.1.8.5.11</td>
<td>procedure.targetSite</td>
</tr>
<tr>
<td>Specimen collection procedure</td>
<td>Cervix-Specimen Collection Procedure</td>
<td>procedure.code</td>
<td>CD</td>
<td>specimen collection procedure</td>
<td>1.3.6.1.4.1.19376.1.8.5.35</td>
<td>procedure.targetSite</td>
</tr>
<tr>
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<td>procedure.code</td>
<td>CD</td>
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<td>procedure.targetSite</td>
</tr>
<tr>
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<td>CD</td>
<td>specimen collection procedure</td>
<td>1.3.6.1.4.1.19376.1.8.5.65</td>
<td>procedure.targetSite</td>
</tr>
<tr>
<td>Specimen collection procedure</td>
<td>Esophagus-Specimen Collection Procedure</td>
<td>procedure.code</td>
<td>CD</td>
<td>specimen collection procedure</td>
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<tr>
<td>Specimen collection procedure</td>
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<tr>
<td>Specimen collection procedure</td>
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<td>procedure.code</td>
<td>CD</td>
<td>specimen collection procedure</td>
<td>1.3.6.1.4.1.19376.1.8.5.117</td>
<td>procedure.targetSite</td>
</tr>
</tbody>
</table>

- **procedure.code**
- **procedure.targetSite**
An AP observation within an organ-specific APSR Document Content Module represents:

- the value of the AP observation
- its status, effective time
- various participants (persons, devices, organizations)
- a number of additional properties (method, interpretation, text),
- embedded images, comments, and sub-observations, which are also AP observations.
Conformance of an AP observation

Observation(s) that can be performed in a specific context (organ, problem)

Various possible result values for this specific observation performed in a specific context (organ, problem)

constraining the vocabularies for the contextual organ
## List of AP Observation Templates per Document template

<table>
<thead>
<tr>
<th>Document template id</th>
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<th>Element template id</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Distance of lesion from closest involved margin</td>
<td>Breast-in-situ neoplasm-Distance of lesion from closest involved margin</td>
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<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Histologic grade of ductal carcinoma in situ (DCIS)</td>
<td>Breast-in-situ neoplasm-Histologic grade of ductal carcinoma in situ (DCIS)</td>
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<tr>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Histologic type</td>
<td>Breast-in-situ neoplasm-Histologic type</td>
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<tr>
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<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Lesion site</td>
<td>Breast-in-situ neoplasm-Lesion site</td>
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<td>Breast-in-situ neoplasm-Lesion size, largest dimension</td>
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<td>Margins involvement</td>
<td>Breast-in-situ neoplasm-Margins involvement</td>
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<td>Breast-in-situ neoplasm-Necrosis of ductal carcinoma in situ (DCIS)</td>
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<tr>
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<td>Breast APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.1</td>
<td>Distance of lesion from closest involved margin</td>
<td>Breast-infiltrating malignant neoplasm-Distant</td>
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<td>Breast-infiltrating malignant neoplasm-Extensive Intraductal component</td>
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<td>Breast-infiltrating malignant neoplasm-HER2/neu (FISH method)</td>
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<td>Histologic grade (Nottingham Histologic Score-Glandular)</td>
<td>Breast-infiltrating malignant neoplasm-Histologic grade (Nottingham Histologic Score-Glandular)</td>
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<td>Histologic grade (Nottingham Histologic Score-Mitotic)</td>
<td>Breast-infiltrating malignant neoplasm-Histologic grade (Nottingham Histologic Score-Mitotic)</td>
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<td>Histologic grade (Two-Tier Grading System)</td>
<td>Breast-infiltrating malignant neoplasm-Histologic grade (Two-Tier Grading System)</td>
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<td>Lesion site</td>
<td>Breast-infiltrating malignant neoplasm-Lesion site</td>
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</table>

<table>
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<th>Element template id</th>
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<td>Colon APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.2</td>
<td>Distance of lesion from closest involved margin</td>
<td>Colon-infiltrating malignant neoplasm-Distance of lesion from closest involved margin</td>
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<td>Extent</td>
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<td>Histologic Features Suggestive of Microsatellite Instability</td>
<td>Colon-infiltrating malignant neoplasm-Histologic Features Suggestive of Microsatellite Instability</td>
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<td>Histologic grade (Two-Tier Grading System)</td>
<td>Colon-infiltrating malignant neoplasm-Histologic grade (Two-Tier Grading System)</td>
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<td>49.1.3.6.1.19376.1.8.1.1.2.2</td>
<td>Colon APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.2</td>
<td>Lesion site</td>
<td>Colon-infiltrating malignant neoplasm-Lesion site</td>
</tr>
<tr>
<td>49.1.3.6.1.19376.1.8.1.1.2.2</td>
<td>Colon APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.2</td>
<td>Lesion size, largest dimension</td>
<td>Colon-infiltrating malignant neoplasm-Lesion size, largest dimension</td>
</tr>
<tr>
<td>49.1.3.6.1.19376.1.8.1.1.2.2</td>
<td>Colon APSR</td>
<td>1.3.6.1.4.1.19376.1.8.1.1.2.2</td>
<td>Lymph-vascular invasion</td>
<td>Colon-infiltrating malignant neoplasm-Lymph-vascular invasion</td>
</tr>
</tbody>
</table>
# IHE PAT Element templates

## AP Observation Templates

<table>
<thead>
<tr>
<th>Element name</th>
<th>Element fully specified name</th>
<th>Rim source</th>
<th>Element type</th>
<th>Concept domain</th>
<th>Value set or code</th>
<th>Rim source</th>
<th>Element type</th>
<th>Value set (for CD element)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance of lesion from closest uninvolved margin</td>
<td>Breast-In situ neoplasm-Distance of lesion from closest uninvolved margin</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>414</td>
<td></td>
<td></td>
<td>PQ</td>
</tr>
<tr>
<td>Histologic grade of ductal carcinoma in situ (DCIS)</td>
<td>Breast-In situ neoplasm-Histologic grade of ductal carcinoma in situ (DCIS)</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>417</td>
<td></td>
<td></td>
<td>CD</td>
</tr>
<tr>
<td>Histologic type</td>
<td>Breast-In situ neoplasm-Histologic type</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>436</td>
<td></td>
<td></td>
<td>CD</td>
</tr>
<tr>
<td>Lesion site</td>
<td>Breast-In situ neoplasm-Lesion site</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>1906</td>
<td></td>
<td></td>
<td>CD</td>
</tr>
<tr>
<td>Lesion size, largest dimension</td>
<td>Breast-In situ neoplasm-Lesion size, largest dimension</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>435</td>
<td></td>
<td></td>
<td>PQ</td>
</tr>
<tr>
<td>Margins involvement</td>
<td>Breast-In situ neoplasm-Margins involvement</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>413</td>
<td></td>
<td></td>
<td>BL</td>
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<tr>
<td>Necrosis of ductal carcinoma in situ (DCIS)</td>
<td>Breast-In situ neoplasm-Necrosis of ductal carcinoma in situ (DCIS)</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>1901</td>
<td></td>
<td></td>
<td>CD</td>
</tr>
<tr>
<td>Distance of lesion from closest uninvolved margin</td>
<td>Breast-Infiltrating malignant neoplasm-Distance of lesion from closest uninvolved margin</td>
<td></td>
<td>CD</td>
<td>anatomic pathology observation</td>
<td>70</td>
<td></td>
<td></td>
<td>PQ</td>
</tr>
</tbody>
</table>
Vocabulary constraints
IHE_PAT_Suppl_APSR_AppendixValue_Sets
http://www.ihe.net (excel file)

IHE Anatomic Pathology Technical Framework Supplement
Appendix Value Sets for APSR
value sets bound to the content modules described in the “Anatomic Pathology Structured Reports” (APSR) supplement to the AP TF

<table>
<thead>
<tr>
<th>Document Identification</th>
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</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Creation date</td>
</tr>
<tr>
<td>Version</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Historique</th>
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<tbody>
<tr>
<td>Version</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Draft for public comment</td>
</tr>
<tr>
<td>Trial Implementation</td>
</tr>
</tbody>
</table>

- Scope : Element Content Modules
- Specimen collection procedure
- AP observation
STS (Standard Terminology Server)

CTS2

SKOS

OWL
PathLex

Current status

- Structure
  - Permanent identifiers (codes) are meaningless
  - PathLex preferred terms are organized into a is-a hierarchy
    - Histological type
      - Histological type of breast neoplasm
        - Histological type of in situ neoplasm of the breast
  - Multilingual: universal value sets include all possible values available in the local extensions.
    - Common values are therefore available in multiple languages (currently English and French).

- Open access
  - “Appendix Value Sets for APSR” as part of the IHE content profile “Anatomic Pathology Structured Report” (APSR) (https://ihe.net)
  - STS (PHAST, France) (CTS2 services)
Mapping PathLex to SNOMED CT (using UMLS) in collaboration with NLM (B.Rance – O.Bodenreider)

PathLex Short label

TNM 432
No TNM 1349

UMLS Search EM/NM

CUI
No CUI

Split label

No new tokens
New tokens

No CUI
CUI

Metamap

SNOMED CT
To be explored

Exact match
SNOMED CT
No SNOMED CT

Partial match
SNOMED CT
No SNOMED CT
## Results of the automatic mapping process

<table>
<thead>
<tr>
<th>Matching situations</th>
<th>Number of labels</th>
<th>Percentages of labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labels mapped to SNOMED CT through exact match (EM) or normalized match (NM) to UMLS</td>
<td>609</td>
<td>45%</td>
</tr>
<tr>
<td>Labels mapped to another terminology through exact match (EM) or normalized match (NM) to UMLS</td>
<td>79</td>
<td>6%</td>
</tr>
<tr>
<td>Tokens mapped to SNOMED CT through exact match (EM) or normalized match (NM) to UMLS</td>
<td>232</td>
<td>17%</td>
</tr>
<tr>
<td>Tokens mapped to another terminology through exact match (EM) or normalized match (NM) to UMLS</td>
<td>25</td>
<td>2%</td>
</tr>
<tr>
<td>Tokens without any match</td>
<td>80</td>
<td>6%</td>
</tr>
<tr>
<td>Labels without any match and that cannot be split in tokens</td>
<td>324</td>
<td>24%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1349</td>
<td>100%</td>
</tr>
</tbody>
</table>
Examples of PathLex labels/expressions with automatic mappings

<table>
<thead>
<tr>
<th>Categories of observations</th>
<th>PathLex label</th>
<th>CUI</th>
<th>SNOMED CT code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples of AP macroscopic observation types related to the specimen</strong></td>
<td>Specimen size, largest dimension</td>
<td>C1273739</td>
<td>384627007</td>
</tr>
<tr>
<td></td>
<td>Specimen size, additional dimension</td>
<td>C1273738</td>
<td>384626003</td>
</tr>
<tr>
<td><strong>Examples of AP microscopic observation types related to a lesion related to a lesion</strong></td>
<td>Lesion size, largest dimension</td>
<td>C1275593</td>
<td>396361002</td>
</tr>
<tr>
<td></td>
<td>Lesion site</td>
<td>C0449685</td>
<td>246300000</td>
</tr>
<tr>
<td></td>
<td>Histologic type</td>
<td>C0449574</td>
<td>263541007</td>
</tr>
<tr>
<td></td>
<td>Histologic grade</td>
<td>C0919553</td>
<td>371469007</td>
</tr>
<tr>
<td></td>
<td>Margins involvement</td>
<td>C1269794</td>
<td>371488000</td>
</tr>
<tr>
<td>Types of ancillary techniques</td>
<td>HER2/neu (FISH method)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mismatch Repair Proteins-MLH1 (Immunohistochemistry Study)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Types of histologic grades</td>
<td>Histologic grade (Clark)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Histologic grade (Gleason-Primary (Predominant) Pattern)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Histologic grade (Gleason-Total Gleason Score)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>Number of lymph nodes with isolated tumor cells (&lt; = 0.2 mm and &lt; = 200 cells)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anatomic location</td>
<td>Anterior floor of mouth (qualifier: right, left, medial)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distal esophagus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Histologic types</td>
<td>Atelectasis Extends to the hilar region but does not involve entire lung</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Atypical squamous cells for which a high-grade lesion cannot be excluded (ASC-H)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cirrhosis/severe fibrosis (Ishak score 5-6) (F1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Combined small cell carcinoma (small cell carcinoma and non-small cell component)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complex hyperplasia without cytologic atypia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DCIS Comedo</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ductal carcinoma in situ involving nipple skin (Paget disease) with microinvasion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Histologic grades | FIGO grade 1  
|                  | G1: Nuclei round, uniform, approximately 10 mm; nucleoli inconspicuous or absent  
|                  | Low-grade squamous intraepithelial lesion encompassing HPV infection or mild dysplasia (CIN 1)  
|                  | Score 2: 10% to 75% of tumor area forming glandular/tubular structures  
| Extension        | <50% myometrial invasion  
| Results of AP ancillary techniques | Amplified (HER2 gene copy >6.0 or ratio >2.2)  
|                  | Equivocal (HER2 gene copy 4.0 to 6.0 or ratio 1.8 to 2.2)  
|                  | Immunoreactive tumor cells present (> = 1%) (Specify Quantitation)  
|                  | Mild to moderate (0-2 per high-power [X400] field) Intratumoral Lymphocytic Response (tumor-infiltrating lymphocytes)  

Shall we map TNM to SNOMED CT?

<table>
<thead>
<tr>
<th>TNM values</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>pM1c: Metastasis to all other visceral sites or distant metastasis at any site associated with an elevated serum lactic dehydrogenase (LDH)</td>
<td></td>
</tr>
<tr>
<td>pN2: Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension, or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension</td>
<td></td>
</tr>
<tr>
<td>pT2a: Tumor greater than 3 cm, but 5 cm or less in greatest dimension surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (ie, not in the main bronchus); or Tumor 5 cm or less in greatest dimension with any of the following features of extent: involves main bronchus, 2 cm or more distal to the carina; invades the visceral pleura; associated with atelectasis or obstructive pneumonitis that extends to the hilar region but does not involve the entire lung</td>
<td></td>
</tr>
</tbody>
</table>
PathLex as a thematic extension of SNOMED CT? Next steps

- A joint IHE/HL7 Anatomic Pathology – IpaLM initiative
  - Governance & technical issues (tooling) for the management of PathLex.
- IPALM SIG
  - Rajesh Dash, M.D. (r.dash@duke.edu)
  - Andrea Pitkus, CAP (apitkus@cap.org)
  - Technical assistance IHTSDO
    - Yohani Daruis (yda@ihtsdo.org)(support@ihtsdo.org)
- IPALM collaborative site
  - IC0604 members
    - Thomas Schrader (Germany) thomas.schrader@computer.org
    - Bernd Blobel (Germany) bernd.bobel@klinik.uni-regensburg.de
    - Christel Daniel (France) christel.daniel@spim.jussieu.fr
    - Vincenzo Della Mea (Italy) vincenzo.dellamea@uniud.it
Deployment, Road map & Governance
Significant Deployment Activity

- **APW**: implemented by vendors in "real world" in Spain (Hospital General de Ciudad Real) and on-going implementation in Paris (AP-HP)
- **ARPH**: North America (NAACCR, CDC)
  - Successfully tested at 2010 NA Connectathon (One sender, one receiver)
  - Successfully tested at 2011 NA Connectathon (one sender, same receiver as 2010)
- **APSR**: on-going implementation by vendors in "real world" in France (DMP & DCC project, ASIP Santé-INCa)
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 2010</td>
<td>PC&amp;TC meeting : discussion of 2010-11 Profiles/White papers</td>
<td>IHE AP &amp; HL7 AP joint meeting (HL7 Meeting - Cambridge, MA)</td>
</tr>
<tr>
<td>Dec 2010</td>
<td>Selection of 2010-11 Profiles/White papers</td>
<td></td>
</tr>
<tr>
<td><strong>2011</strong></td>
<td><strong>Jan 2011</strong></td>
<td>US Connectathon</td>
</tr>
<tr>
<td>March 2011</td>
<td>Publication of trial implementation supplement</td>
<td>Ihe.net</td>
</tr>
<tr>
<td>Jan 2011</td>
<td>PC&amp;TC meeting</td>
<td>European Connectathon</td>
</tr>
<tr>
<td>May 2011</td>
<td>PC&amp;TC meeting</td>
<td>IHE AP &amp; HL7 AP joint meeting (HL7 WG Meeting – Orlando)</td>
</tr>
<tr>
<td>June 20-21, 2011</td>
<td>PC&amp;TC meeting</td>
<td>IHE/HL7 AP &amp; IC0604 COST Action WG1/WG2 joint meeting (Paris)</td>
</tr>
<tr>
<td>Aug 27, 2011</td>
<td>PC&amp;TC meeting</td>
<td>IHE/HL7 AP &amp; IC0604 COST Action WG2 &amp; DICOM WG26 joint meeting (Helsinki)</td>
</tr>
<tr>
<td>Sept 13-15, 2011</td>
<td>Submission of 2011-12 Profiles/White papers</td>
<td>IHE AP &amp; HL7 AP joint meeting (HL7 Meeting - San Diego)</td>
</tr>
<tr>
<td>Dec 2011</td>
<td>Selection of 2011-12 Profiles/White papers</td>
<td></td>
</tr>
<tr>
<td><strong>2012</strong></td>
<td><strong>Jan, 2011</strong></td>
<td>IHE AP &amp; HL7 AP &amp; DICOM WG26 joint meeting (HL7 Meeting - San Antonio) (to be confirmed)</td>
</tr>
<tr>
<td>June 6-9, 2012</td>
<td>Publication of public comment supplement</td>
<td>Telepathology &amp; Virtual - microscopy – Venice (to be confirmed)</td>
</tr>
<tr>
<td>August, 2012</td>
<td>Publication of trial implementation supplement</td>
<td>Ihe.net</td>
</tr>
</tbody>
</table>
Change proposals/Profiles/White papers

- 2010-11
  - Change proposals
    - Integration: Anatomic Pathology Structured Order (APW - PAT-1)
    - Content: Anatomic Pathology Structured Reports (for Biobanks) (APSR)
  - Integration Profiles
    - Anatomic Pathology Reporting Workflow (APRWF) (G. Rodriguez – Satec)
  - Content Profiles
  - White papers
    - Enhanced Imaging Workflow Integration Profile

- 2011-12?
  - Integration Profiles +++
    - Anatomic Pathology Reporting Workflow (APRWF) (G. Rodriguez – Satec)
  - White papers ??
    - Enhanced Imaging Workflow Integration Profile (-> IP)
    - Device automation integration profile (with LAB, ITI)
    - Inter-departments workflow (with LAB ITI)
    - Telepathology (with ITI)
      - Opinion request (content and workflow)
    - Relationships between pathology/radiology/endoscopy
    - Sharing templates/terminology (with ITI)
IHE AP sponsors & committees

Co-chair election

- Sponsors
  - French Association for the Development of Informatics in Pathology (ADICAP)
  - Spanish Health Informatics Society (SEIS)
  - Spanish Society of Pathology (SEAP)
  - CAP?
  - ESP? WASPalm? etc

- Secretary
  - Christel Daniel  (email: christel.daniel@crc.jussieu.fr)

- Planning/Technical Committee Co-chairs
  - Dr Christel DANIEL (ADICAP)
  - Dr. Marcial García Rojo (SESCAM)
  - Dr Thomas Schrader

- CO-CHAIR ELECTION
More information

- **Googlegroup**: ihe-anatomic-pathology-committee@googlegroups.com


---

Anatomic Pathology

IHE Anatomic Pathology addresses information sharing, workflow and patient care in Pathology, including anatomical pathology.

IHE Anatomic Pathology is sponsored by the following organizations: ACOCAP, the Spanish Hospital Informatics Society (SSEI), the Spanish Society of Pathology (SEAP), the French Society of Pathology (SFP). It manages the Pathology Worklist and the Pathology Technical Framework.

The aim of the IHE initiative in anatomic pathology is to enable the exchange of information, such as patient history, laboratory results, and images, among different healthcare providers. This integration facilitates efficient workflow, improves patient care, and enhances the quality of diagnostic processes. Anatomic pathology is crucial in the evaluation and diagnosis of diseases, particularly in the context of surgical pathology, where the pathological findings are critical for planning appropriate treatment strategies.

The process of anatomic pathology involves the receipt of tissue samples or specimens from various sources such as biopsies, surgical specimens, or autopsy material. These samples are then processed, stained, and examined microscopically to identify and characterize abnormalities. The diagnostic process is not only crucial for identifying the presence of disease but also for determining the stage, grade, and potential for recurrence of the disease.

In conclusion, the integration of anatomic pathology within the IHE framework enables a structured approach to information exchange, enhancing the collaboration among healthcare professionals and ultimately improving patient outcomes.

---

Information systems in anatomic pathology laboratories gather medical data (text, images, etc.) throughout specimen management from specimen accession to report writing. The diagnostic process in anatomic pathology, Figure 1, differs from that in the clinical laboratory, since it relies on image interpretation. It also differs from that in radiology since it is specimen-based and when digital imaging is performed many types of imaging equipment (gross imaging, microscopic, histology, whole slide imaging, multiparametric imaging, etc.) may be involved for a single examination. Moreover, images of the same study may be related to different specimen (gall and/or slides) from one or even different patients (e.g., tissue